

DIY



Worthwhile projects you can build on your own



6-meter Copper J-pole Antenna

Every Friday night at 8 pm in Utah County, and again at 9 pm in Salt Lake County, the skies are lit up, as it were, by the radiation of 6-meter SSB transmissions. You've heard of these two 6-meter nets, and have wanted to join the little extra fun these exclusive QSOs afford. But not having an appropriate antenna might have been your handicap. Well, wait no longer. This simple yet powerful design for a copper J-pole can remove that disability.

For 6 meters (50 to 54 MHz) this half-wavelength vertical antenna will be rather long, about 15 to 17 feet, so you might want to build it in your garage or other large area. To accommodate this size, we'll make it out of copper tubing, which will be lighter than steel and stronger than aluminum. **Note: if you're not comfortable soldering copper pipe, it's a good idea to find an elmer who is**, or consider this a good time to experiment and learn.

Let's start with a parts list (all copper caps and fittings are *non-threaded*):



SO-239 bulkhead connector

- ✓ One 10-foot 1/2" copper tubing
- ✓ Two 10-foot 3/4" copper tubing
- ✓ One 3/4" X 3/4" X 3/4" copper T fitting
- ✓ One 3/4" X 3/4" copper elbow fitting
- ✓ One 3/4" to 1/2" copper reducer fitting
- ✓ One 3/4" copper cap ✓ One 1/2" copper cap
- ✓ One SO-239 bulkhead (flanged and solderable) connector

- ✓ Four #6 screws (about 3/4"), nuts, and lock washers
- ✓ One #6 ring-type crimp-on lug ✓ Two 3/16" ring-type crimp-on lugs
- ✓ Eight 3/16" machine screws and lock nuts
- ✓ 6" of solid 12 AWG wire (THHN insulation)
- ✓ Two 3-1/2" X 2" X 1-1/2" thick Plexiglas stock



copper cap

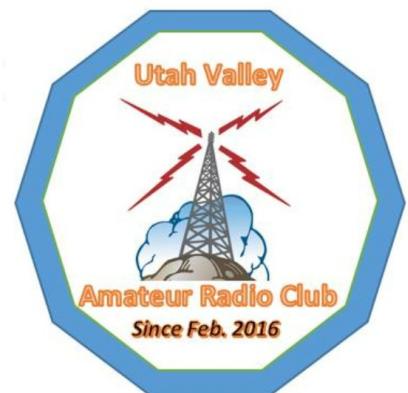


reducer fitting

If you haven't worked with copper pipe before, 1) clean, polish, and flux all joining surfaces; 2) use a tube cutter to keep the tubing round; and 3) de-burr all cuts. Cut one piece of 3/4" tubing 59" long, insert one end into the elbow, and place the 3/4" cap on the other end. Cut another piece of 3/4" tubing 109" long, insert one end into one end of the T fitting, and the other end into the reducer fitting larger end. Cut a third piece of 3/4" tubing such that when inserted into the remaining elbow end and the mid-section of the T fitting, it separates the two parallel (59" and 109") pipes by 2" between them.

Cut one piece of 1/2" tubing 50-1/4" long, insert one end into the reducer fitting smaller end, and place the 1/2" cap on the other end. Insert a 2- to 4-foot section of the remaining 3/4" tubing into the remaining (bottom) end of the T fitting. Solder the entire assembly in place.

Drill a 5/8" hole in the center of one of the two Plexiglas pieces. Insert the SO-239 bulkhead connector in the hole to measure and drill its four #6 mounting holes in the Plexiglas. Drill four 3/16" holes 2-3/4" apart lengthwise and 1-1/4" apart width-wise. Drill the same four 3/16" holes at the same distances apart in the other piece of Plexiglas.



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Drill four holes in the parallel 3/4" tubing assembly to place the Plexiglas **without** the center hole about 6" below the end of the 3/4" cap. Drill four holes in the parallel tubing assembly to position the Plexiglas **with** the center hole so that the two 3/16" holes are 5-5/16" away from the shortest piece of 3/4" tubing, **a critical measurement**.

Bolt the Plexiglas to the tubing and the SO-239 bulkhead connector to the Plexiglas. Snip the 6" piece of solid 12 AWG wire in half. Solder one to the center pin of the connector on one end, and crimp a 3/16" lug on the other end, and attach it to the bottom bolt of the 109" copper tubing. Crimp a 3/16" lug on one end of the other solid 12 AWG wire, and crimp a #6 lug on the other, then bolt this wire between the connector flange and the bottom bolt of the 59" copper tubing.

Due to the wind load of this copper giant, you'll need to hold it in all four directions using guy wire of paracord or similar. Also, to get the best out of your 6-meter antenna, you'll need to mount it high above the ground, like on your roof or other tall structure, by mast attached to your mounting stub.

Because your J-pole is a full half-wavelength, it won't need to be grounded for performance, but you should ground it to provide a path for residual static. Connect your 50-ohm feedline by PL-259 connector, mount this proud copper beauty, and you're ready to go.



Finished J-pole, bottom end



Well, there you have it. Build this gem, and I'll look for your check-in Friday nights on one of the two 6-meter SSB nets. Of course, you'll still need your own radio that's capable of transmitting 6 meters, but if you have an HF rig, chances are it's equipped with 6-meter (50 MHz) capability.

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